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09/902,124

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Faisal Ishtiaq

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EXAMINER

VO, TUNG T

ART UNIT

PAPER NUMBER

2613

3

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/902,124

Applicant(s)

ISHTIAQ ET AL.

Examiner

Tung T. Vo

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 07/01/01 has been considered.

Claim Objections

2. A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

Claim 22 depends on claim 22. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-6, 8-13, 15-24, 26-31, and 33 are rejected under 35 U.S.C. 102(3) as being anticipated by Isu et al. (US 6,697,433 B1).

Re claims 1, 9, 18 and 26, Isu discloses a system (figure 2) that can be integrated in a computer for carrying out the method of decoding a digital video signal comprising a sequence of image frames, each image frame comprising a sequence of image slices, each image slice comprising a sequence of macroblocks and each macroblock comprising a plurality of pixels (figure 1, e.g. showing MPEG-4 standard, col. 6, line 55 through col. 7, line 10), said system comprising:

an input for receiving said digital video signal (101 of fig. 2);

an image frame store, a memory, for storing a previous image frame (3 of fig. 2);

a macroblock decoder, a digital signal processor (1 of fig. 2), coupled to the input that receives said digital video signal and to said image frame store; and

an error detector, an application specific integrated circuit (8 of fig. 1), coupled to the macroblock decoder,

wherein said error detector is operable to calculate one or more error metrics between pixel values of the plurality of pixels on at least part of a boundary between a current macroblock (BLOCK (m-1, n), BLOCK (m, n), BLOCK (M, n-1) and one or more adjoining macroblocks (Pm-1, n(7,j), Pm,n(0,j), Pm,n(i,0) of fig. 5) and to label the current macroblock as suspicious if the one or more error metrics is greater than a threshold level which is a weighted average error metric from one or more previous image frames ($C_{m,n} > TH2$, ST24 of fig. 9).

Re claims 8, 10, 19, and 33, Isu further discloses wherein an error metric of the one or more error metrics is a sum of absolute differences (ST23 of fig. 9).

Re claim 11, Isu further discloses wherein said macroblock decoder comprises:

a demultiplexer (1 of fig. 2) coupled to the input that receives said digital video signal and configured to output compressed, quantized coefficient data and compressed motion vector data;

an inverse variable-length coder (1 of fig. 2) coupled to said demultiplexer and configured to output quantized coefficient data and motion vector data;

an inverse quantizer (5 of fig. 2) coupled to said inverse variable-length coder and configured to receive said quantized coefficient data and generate coefficient data;

an inverse discrete cosine transformer (6 of fig. 1) coupled to the inverse quantizer and configured to receive said coefficient data and generate a differential macroblock;

a motion compensator (2 of fig. 2) coupled to said inverse variable-length coder and configured to receive said motion vector data and a previous image frame and generate a previous motion compensated macroblock; and

a signal combiner (7 of fig. 2) configured to combine said previous motion compensated macroblock and said differential macroblock to produce a decoded macroblock.

Re claim 12, Isu further discloses further comprising an error concealment element (10 of fig. 2) coupled to said error detector and said image frame store.

Re claim 13, Isu further discloses wherein said error concealment element operates to regenerate any subsequent macroblocks in an image slice if the current macroblock is labeled as suspicious (ST 24, ST26 of fig. 9).

Re claims 2, 16, 20, and 27, Isu further discloses wherein the pixel values are one or more channel components, wherein the one or more error metrics between the pixel values is

calculated for one or more of the one or more channel components (col. 6, lines 55 through col. 7, line 10; figs. 5 and 9, e.g. ST24).

Re claims 3-4, 17, 21-22, and 28-29, Isu further discloses wherein a macro-block is labeled as suspicious if any of the one or more error metrics between the pixel values is greater than the threshold level in one or more corresponding components of the one or more channel components from one or more previous image frames (ST 44 of fig. 15).

Re claims 6, 23, and 30, Isu further discloses wherein the threshold level is a weighted average of the one or more error metrics between pixel values along macroblock boundaries in at least one previous image frame (TH of fig. 9, e.g. note error detection (8 of fig. 2) detects the error partial image region according to a difference between the average of the first pixel levels and the average of each group of second pixel levels and a prescribed threshold value relating to the differences, means is a weighted average of the error metrics).

Re claims 5, 24 and 31, Isu further discloses regenerating all remaining macroblocks in accordance with a concealment strategy if a macroblock is labeled as suspicious (10 of fig. 2).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7, 14-15, 25, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isu et al. (US 6,697,433 B1) in view Kuroda et al. (US 6,385,343).

Re claims 7, 14, 15, 25 and 32, Isu teaches all limitations except a syntax error detector, which is operable to detect syntax errors in the digital video signal, coupled to the error detector; wherein said error concealment element operates to regenerate any macroblocks in an image slice of the sequence of image slices that follows a macroblock labeled suspicious if a syntax error is detected by said syntax error detector as claimed.

However, Kuroda teaches a syntax error detector (1 of fig. 5), which is operable to detect syntax errors in the digital video signal, coupled to the error detector; wherein said error concealment element operates to regenerate any macroblocks in an image slice of the sequence of image slices that follows a macroblock labeled suspicious if a syntax error is detected by said syntax error detector. Therefore, taking the combined teachings of Isu and Kuroda as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the syntax error detector (1 of fig. 5) into the system of Kuroda to perform the same purpose of detecting the syntax error of a encoded bitstream before decoding. Doing so would be possible to avoid the performance error detection by the error block detection means when reception conditions are good and perform overall stable decoding operations as suggested by Kuroda (col. 7, lines 15-20).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2613

Watanabe et al. (US 6,310,897) discloses an information transmitting method, encoder/decoder of information transmitting system using the method, and encoding multiplexer/decoding inverse multiplexer.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung T. Vo whose telephone number is (703) 308-5874. The examiner can normally be reached on 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris. Kelley can be reached on (703) 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


TUNG T. VO
PATENT EXAMINER

T.VO

Tung T. Vo
Examiner
Art Unit 2613